Aeronautical Systems Center

Birthplace, Home and Future of Aerospace

U.S. AIR FORCE

Airworthiness Certification &Global Air Traffic Management

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Major Policy Clarifications

- Civil Operational Airspace Performance Compliance vs. Civil Practice Compliance
- Single Weapon System Airworthiness Certification Process vs. Dual GATM and Air Vehicle Airworthiness Certification Processes
- Roles and Responsibilities

GATM Functional Matrices

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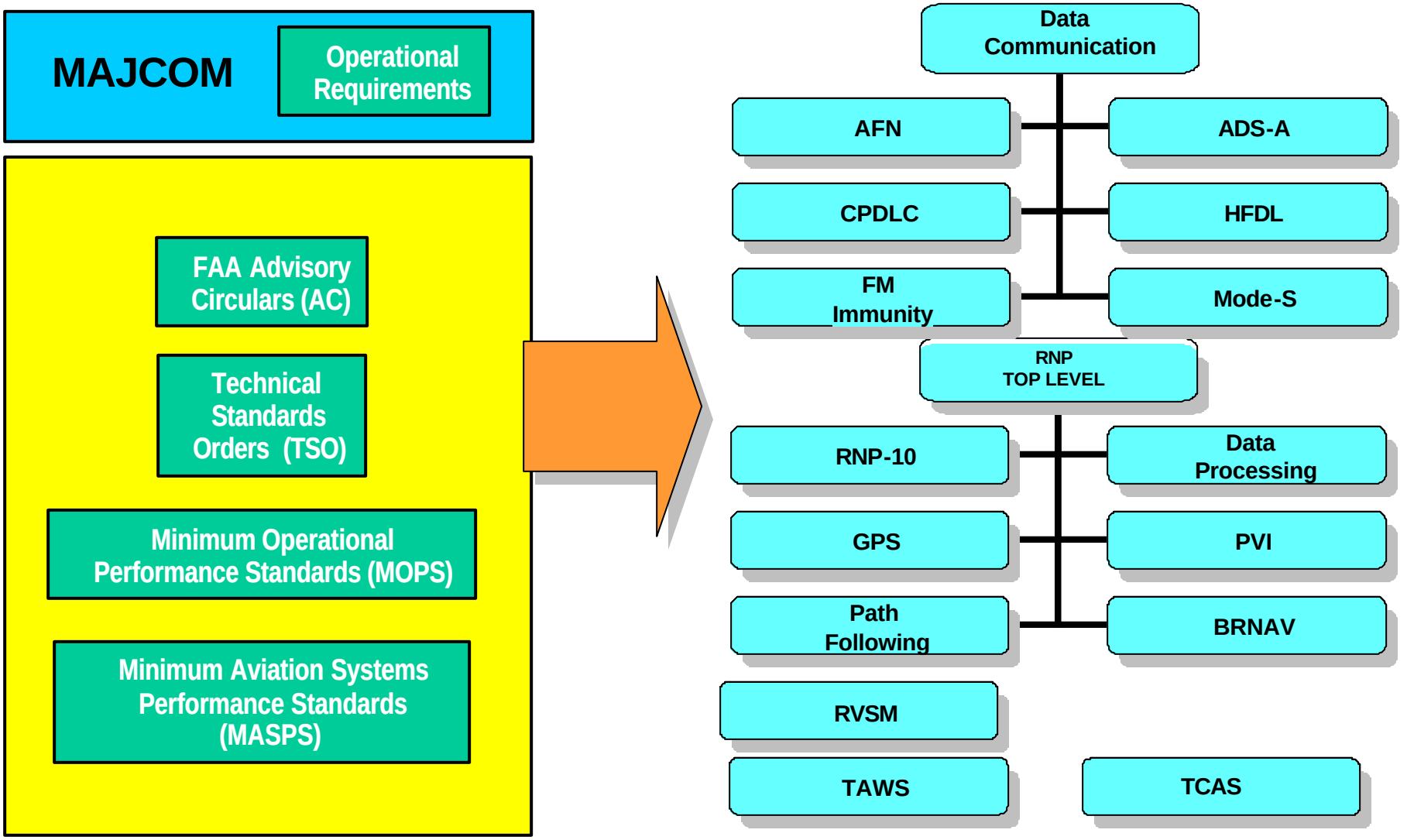

Previous USAF GATM Certification

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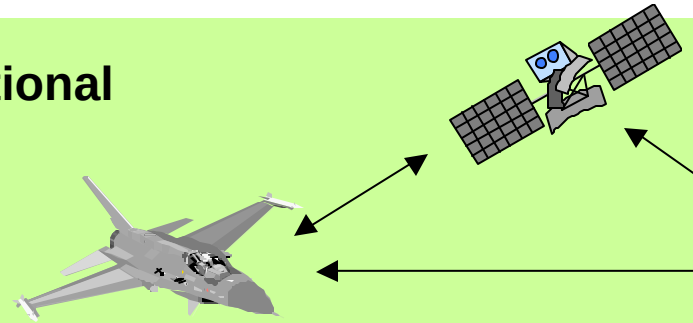
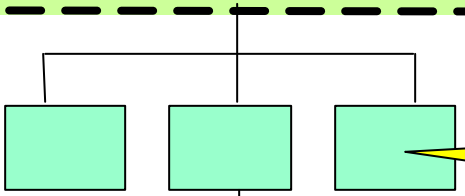
Operational



MAPS

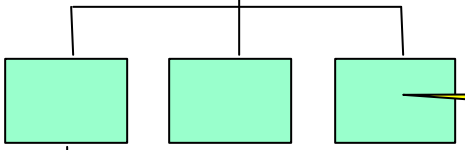
Each aircraft operating in RNP airspace shall have total system error components… that are less than the RNP value 95% of the flying time (RTCA/DO-236A)

Subsystem



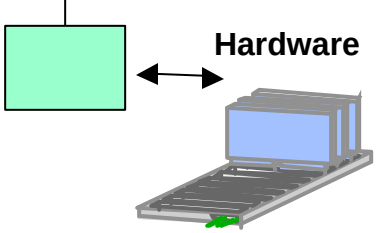
the navigation system installation shall receive airworthiness approval in accordance with one of the following FAA AC's: 90-45A, AC 20-121A, AC 20-130A, AC 20-138, or AC 25-15.

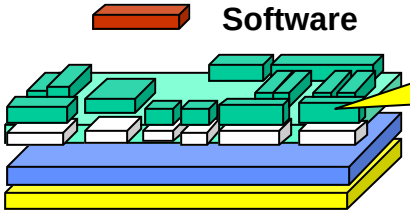
LRU



manufacturer bench tests are IAW Section 2.4.1.2.5 of RTCA/DO-229A

Module





software should be developed to a level of safety equivalent to RTCA/DO-178B

GATM Performance Definition Process

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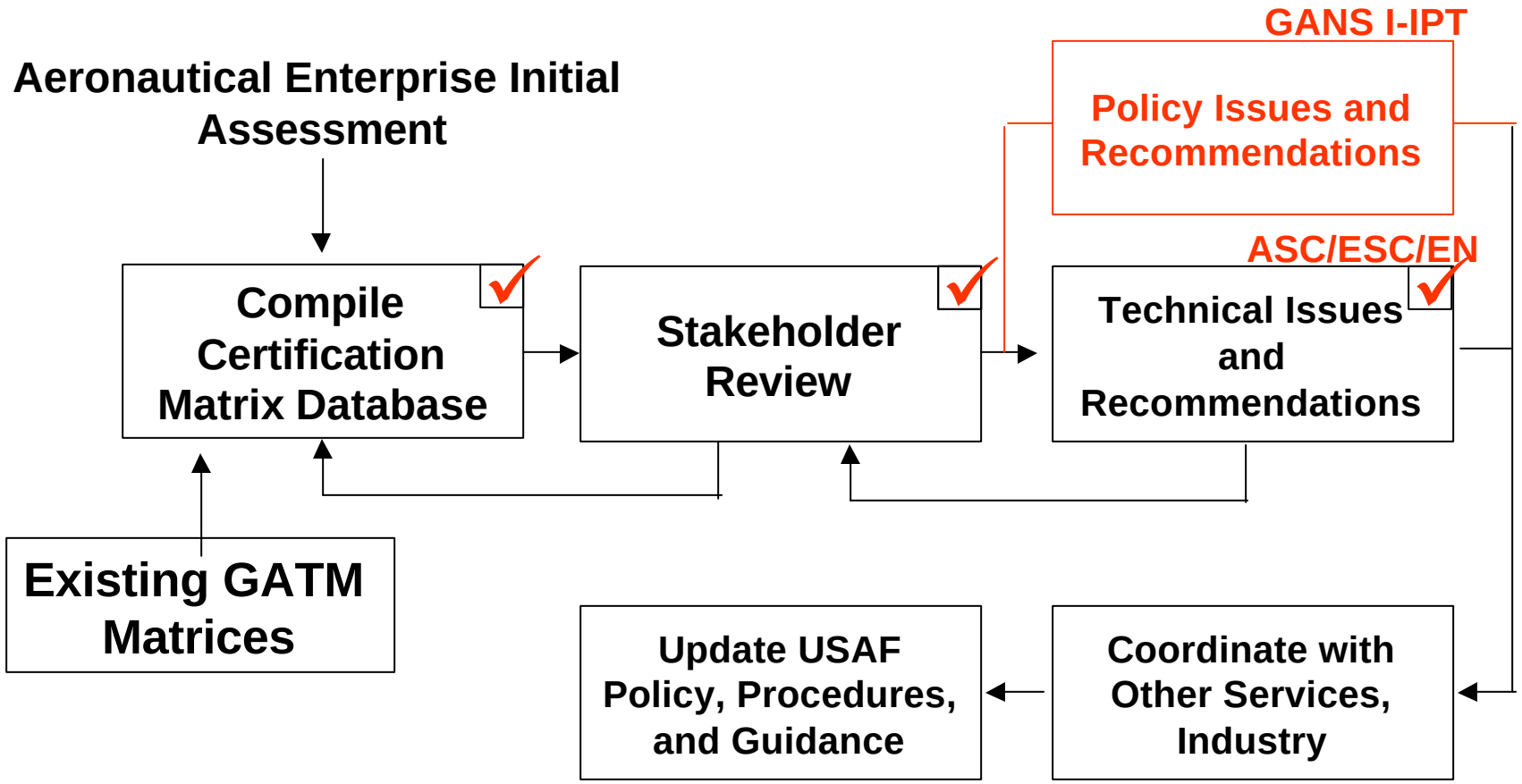

- Performance Based Matrices
- Airworthiness Certification

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AFPD 62-6

USAF Aircraft Airworthiness Certification

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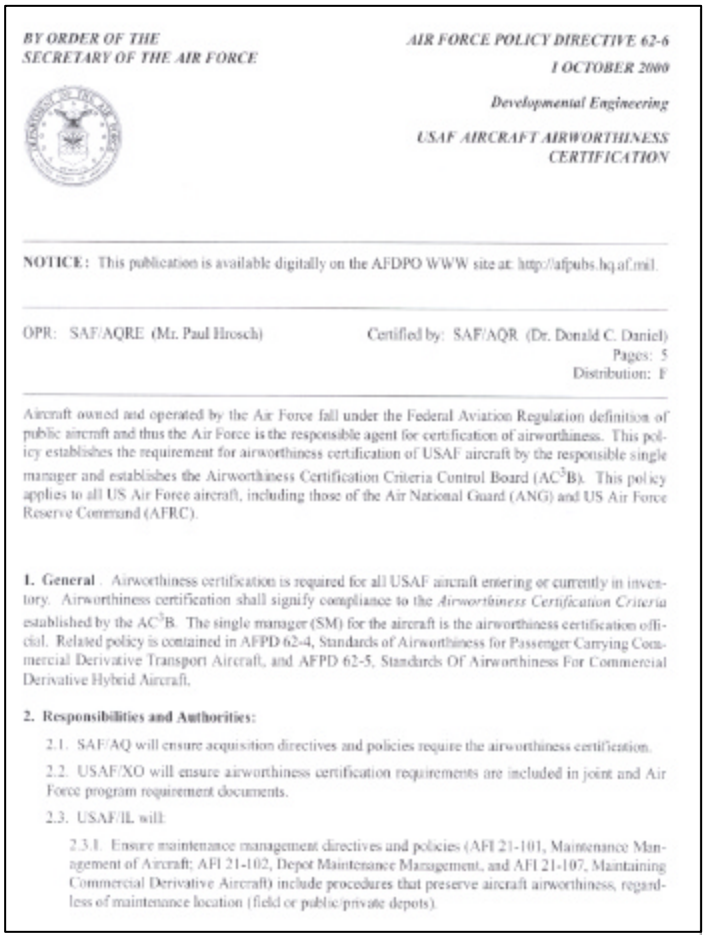

BY ORDER OF THE
SECRETARY OF THE AIR FORCE

AIR FORCE POLICY DIRECTIVE 62-6
1 OCTOBER 2000

Developmental Engineering

USAF AIRCRAFT AIRWORTHINESS CERTIFICATION

NOTICE: This publication is available digitally on the AFDPO WWW site at: http://afpubs.hq.af.mil.

OPR: SAF/AQRE (Mr. Paul Hrosch) Certified by: SAF/AQR (Dr. Donald C. Daniel)
Pages: 5
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Aircraft owned and operated by the Air Force fall under the Federal Aviation Regulation definition of public aircraft and thus the Air Force is the responsible agent for certification of airworthiness. This policy establishes the requirement for airworthiness certification of USAF aircraft by the responsible single manager and establishes the Airworthiness Certification Criteria Control Board (AC^3B). This policy applies to all US Air Force aircraft, including those of the Air National Guard (ANG) and US Air Force Reserve Command (AFRC).

1. General. Airworthiness certification is required for all USAF aircraft entering or currently in inventory. Airworthiness certification shall signify compliance to the *Airworthiness Certification Criteria* established by the AC^3B. The single manager (SM) for the aircraft is the airworthiness certification official. Related policy is contained in AFPD 62-4, Standards of Airworthiness for Passenger Carrying Commercial Derivative Transport Aircraft, and AFPD 62-5, Standards Of Airworthiness For Commercial Derivative Hybrid Aircraft.

2. Responsibilities and Authorities:

2.1. SAF/AQ will ensure acquisition directives and policies require the airworthiness certification.

2.2. USAF/XO will ensure airworthiness certification requirements are included in joint and Air Force program requirement documents.

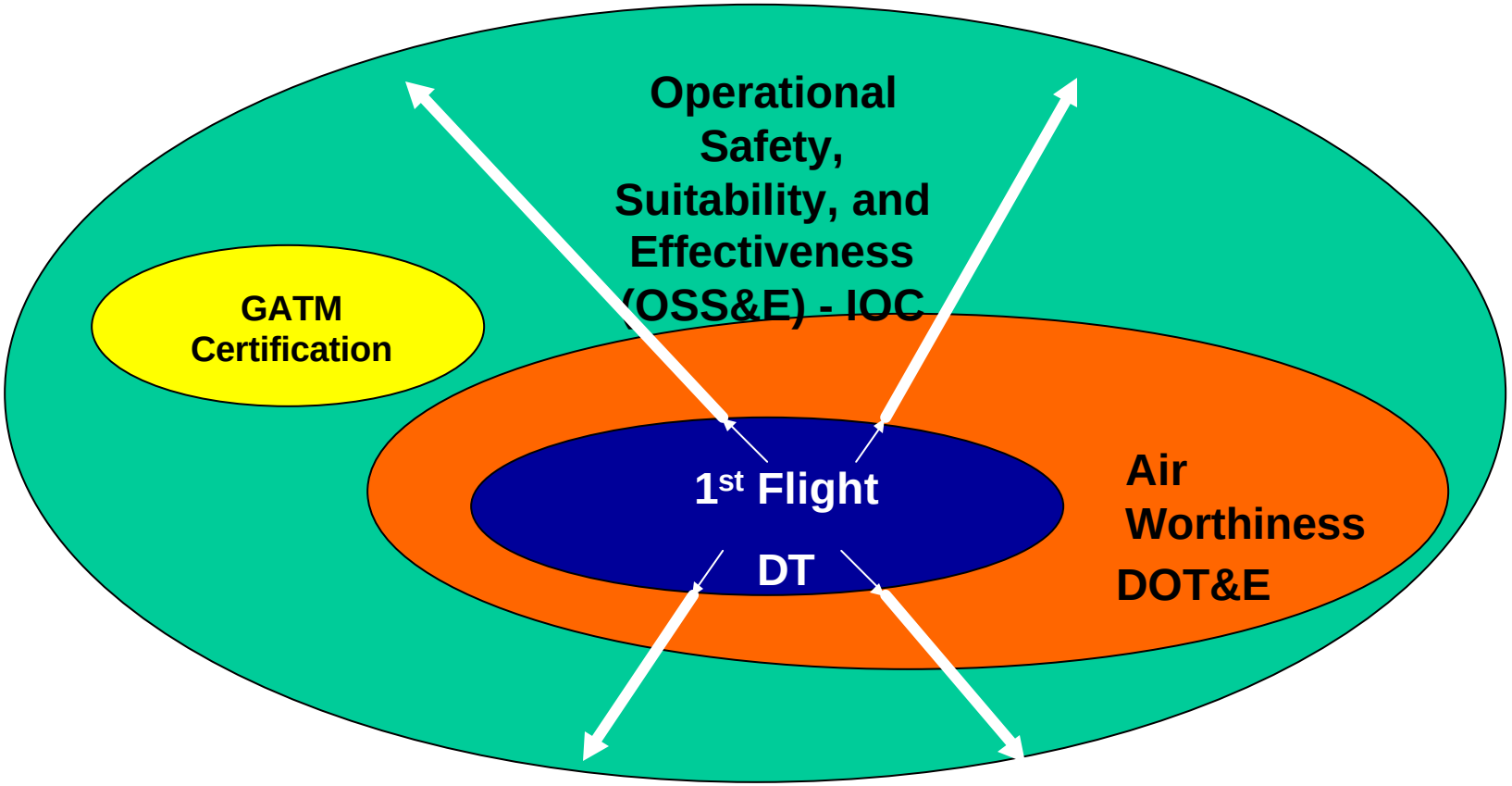
2.3. USAF/IL will:

2.3.1. Ensure maintenance management directives and policies (AFI 21-101, Maintenance Management of Aircraft; AFI 21-102, Depot Maintenance Management, and AFI 21-107, Maintaining Commercial Derivative Aircraft) include procedures that preserve aircraft airworthiness, regardless of maintenance location (field or public/private depots).

- ⇧ Single Manager certifies airworthiness
- ⇧ Single Manager makes and documents a positive determination of safety-of-flight prior to first flight
- ⇧ Airworthiness Certification Criteria Control Board establishes criteria
  - ⇧ Chaired by ASC/CC, Approval Authority
  - ⇧ Broad stakeholder representation
- ⇧ Single Manager recommends changes to *Airworthiness Certification Criteria*
- ⇧ MAJCOMs/Air National Guard/US Air Force Reserves will prohibit alterations or modifications without approval of the SM

Allow legacy aircraft SM sufficient flexibility for certification in cost effective manner consistent with safety

Relationships of Certification Levels



Relationships of Certification Levels

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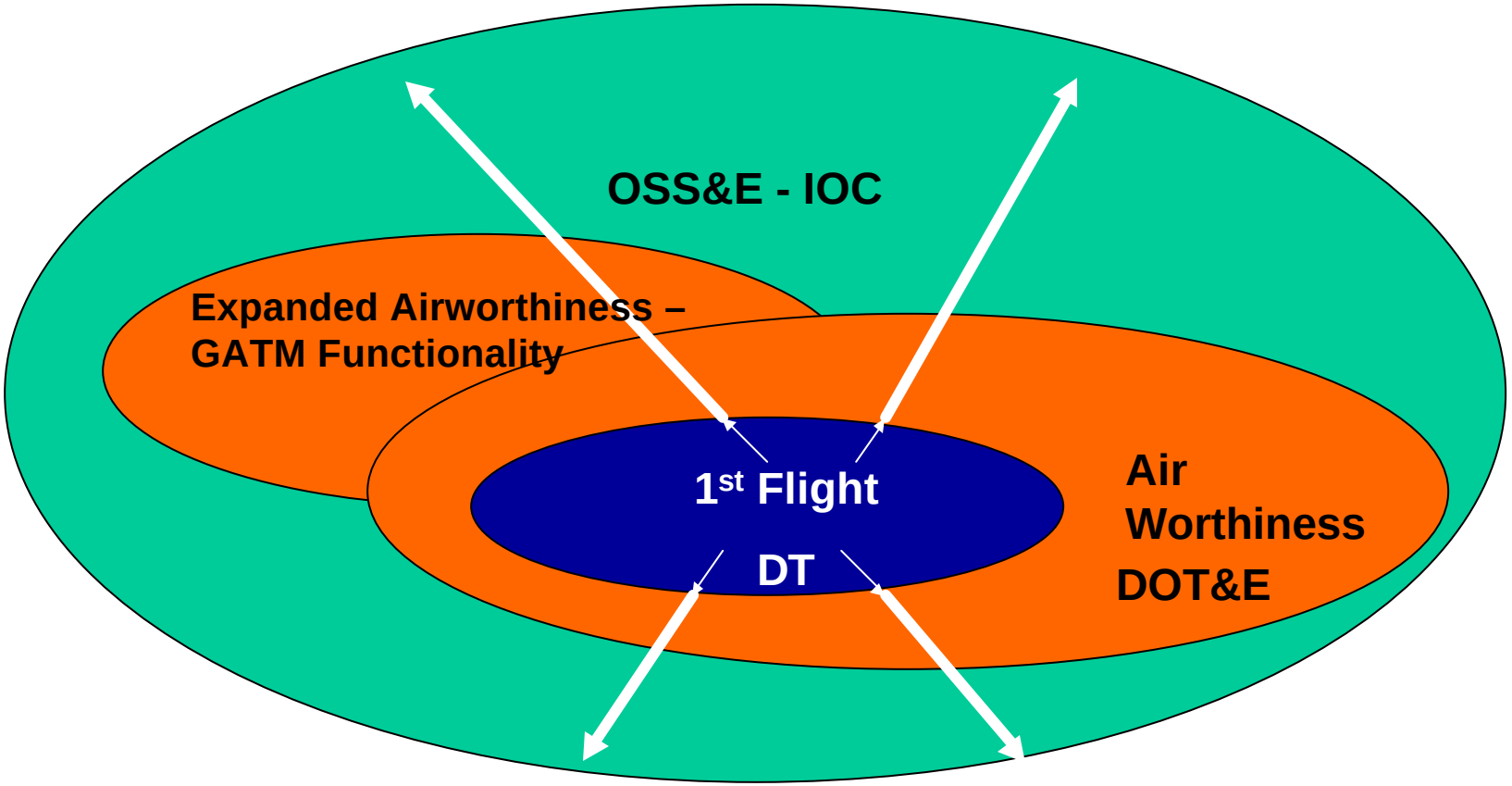
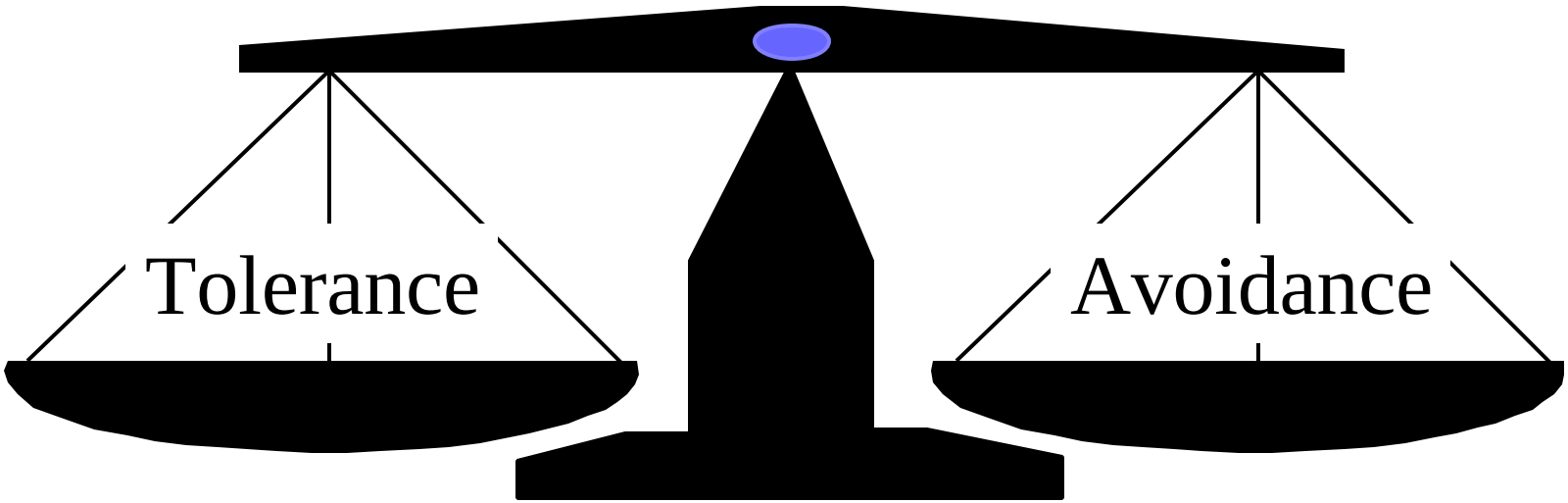


System Assurance Process

- Identify system assurance performance attributes
- Develop fault avoidance and fault tolerance techniques
- Implement design techniques in system architecture
- Perform system analysis to verify fault avoidance and tolerance techniques
- Perform system validation of fault avoidance and tolerance techniques

Fault Management

Fault Avoidance and Fault Tolerance techniques are complementary, and should both be considered in meeting system performance objectives



Relationship of fault avoidance & tolerance techniques

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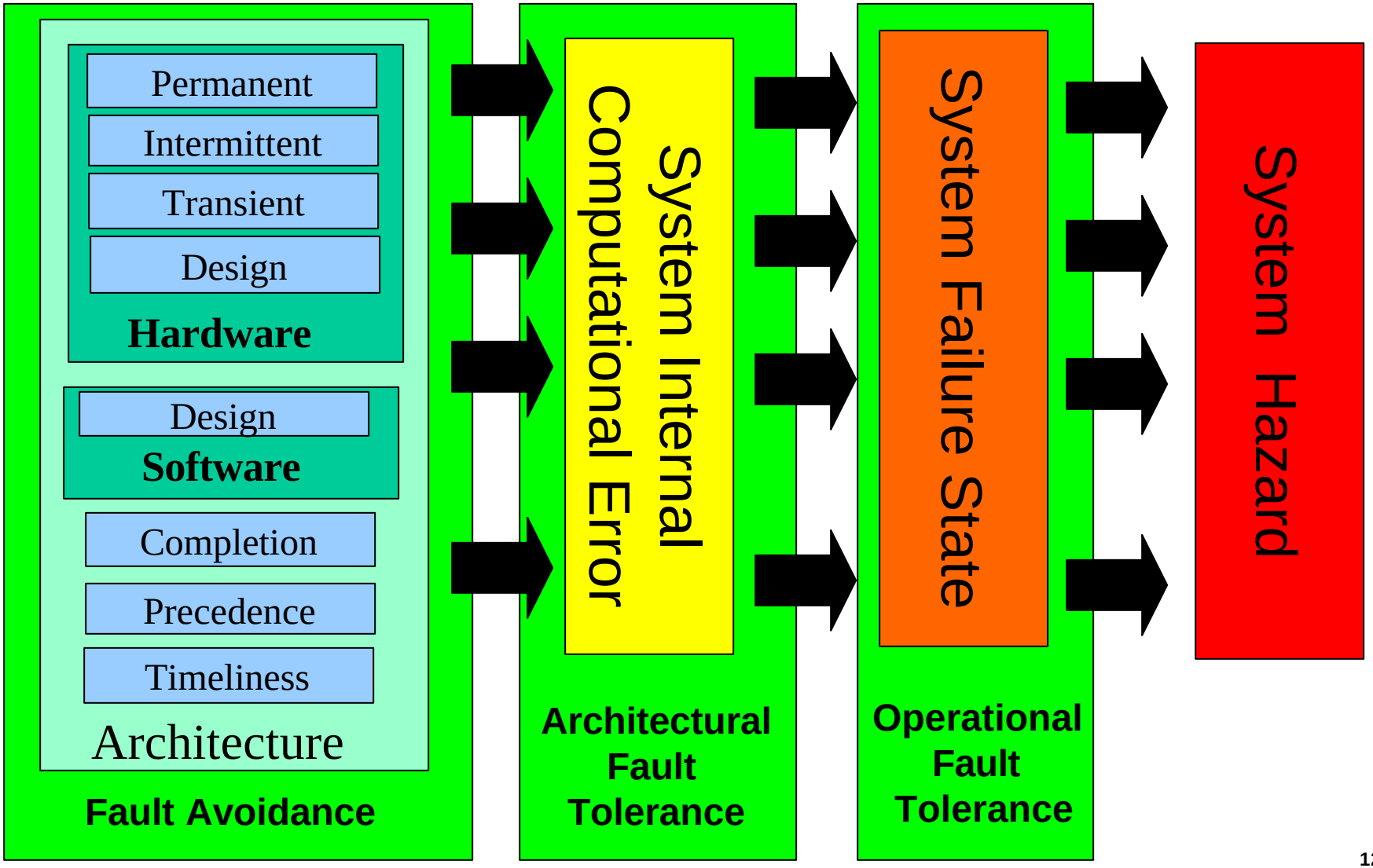

Airworthiness Criteria Examples

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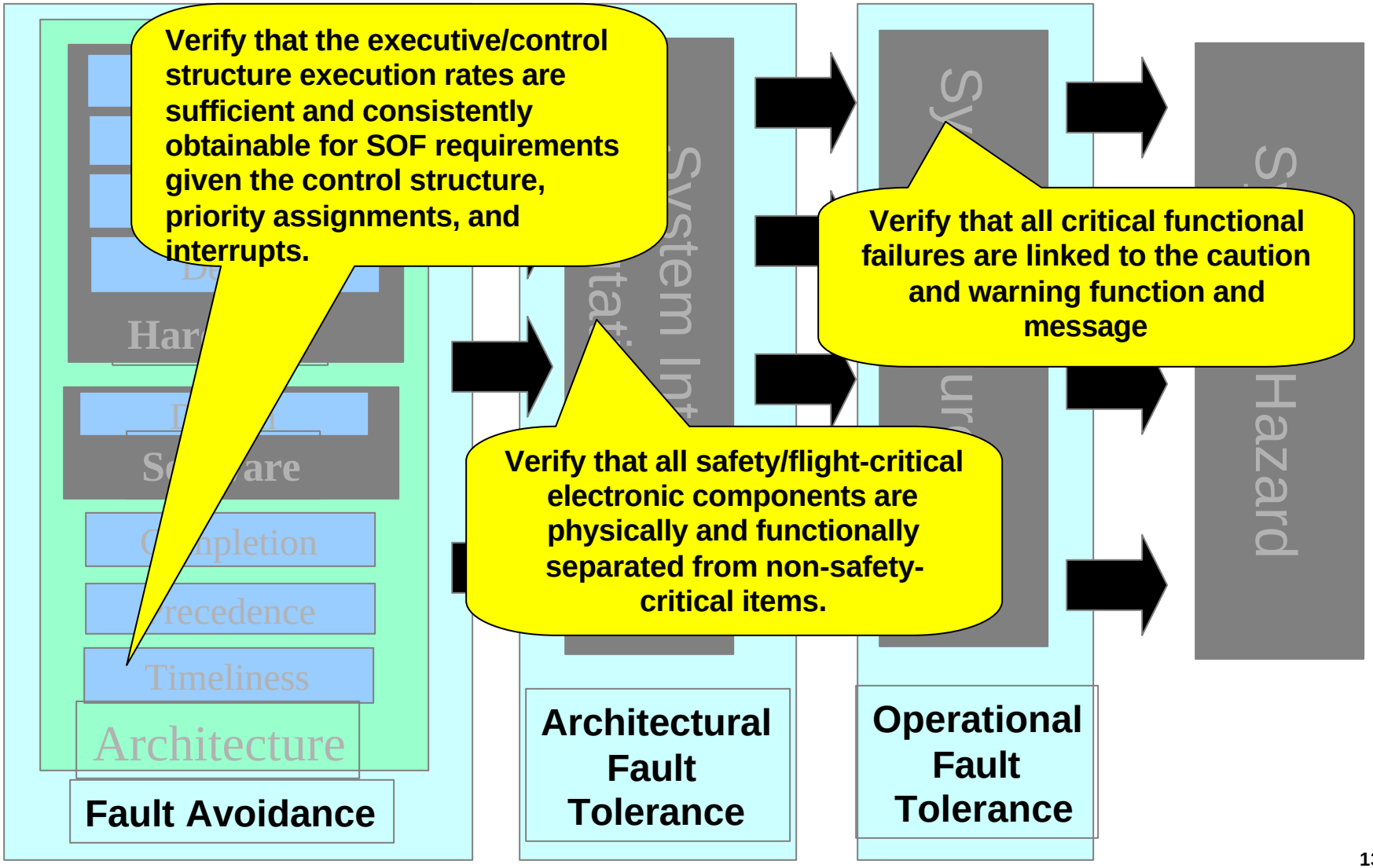

GATM Relationship to Airworthiness Certification Criteria

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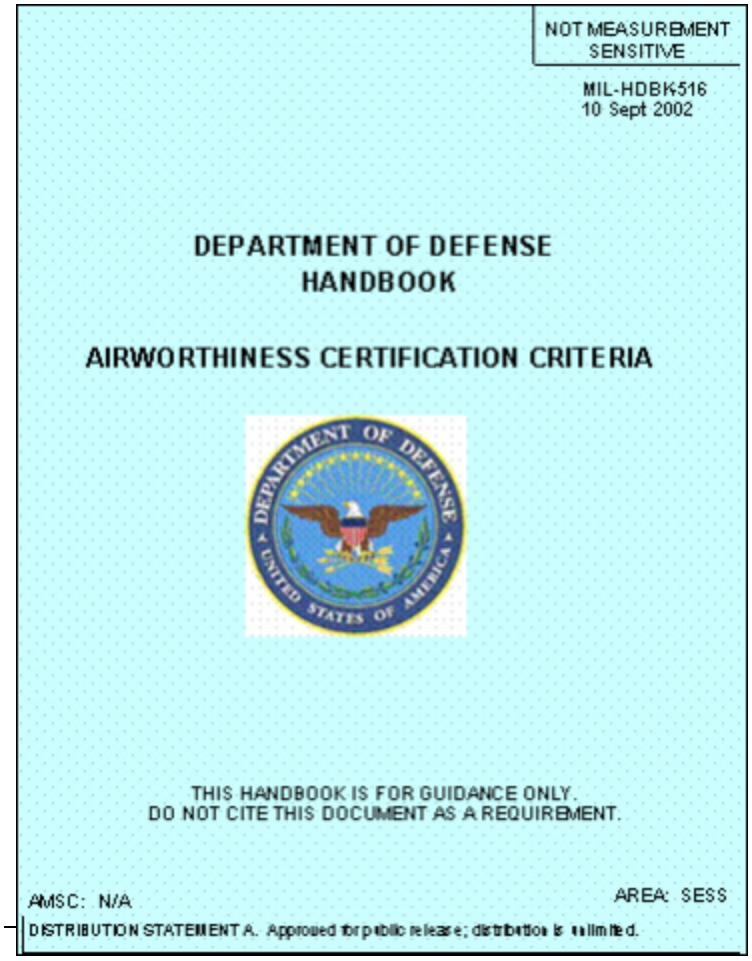
NOT MEASUREMENT SENSITIVE

MIL-HDBK516
10 Sept 2002

DEPARTMENT OF DEFENSE
HANDBOOK

AIRWORTHINESS CERTIFICATION CRITERIA

THIS HANDBOOK IS FOR GUIDANCE ONLY.
DO NOT CITE THIS DOCUMENT AS A REQUIREMENT.

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15 SECTIONS
621 CRITERIA

- [illegible] (11)
- **FLIGHT TECHNOLOGY (16)**
- **CREW SYSTEMS (55)**
- **DIAGNOSTICS SYSTEMS (7)**
- **AVIONICS (18)**
- **ELECTRICAL POWER (16)**
- **COMPUTER RESOURCES (27)**
- **ELECTROMAGNETIC**

ENVIRONMENTAL EFFECTS (13)

Document is available at https://www.en.wpafb.af.mil/oss&e/oss&e_airworthiness.asp

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Airworthiness & GATM Certification

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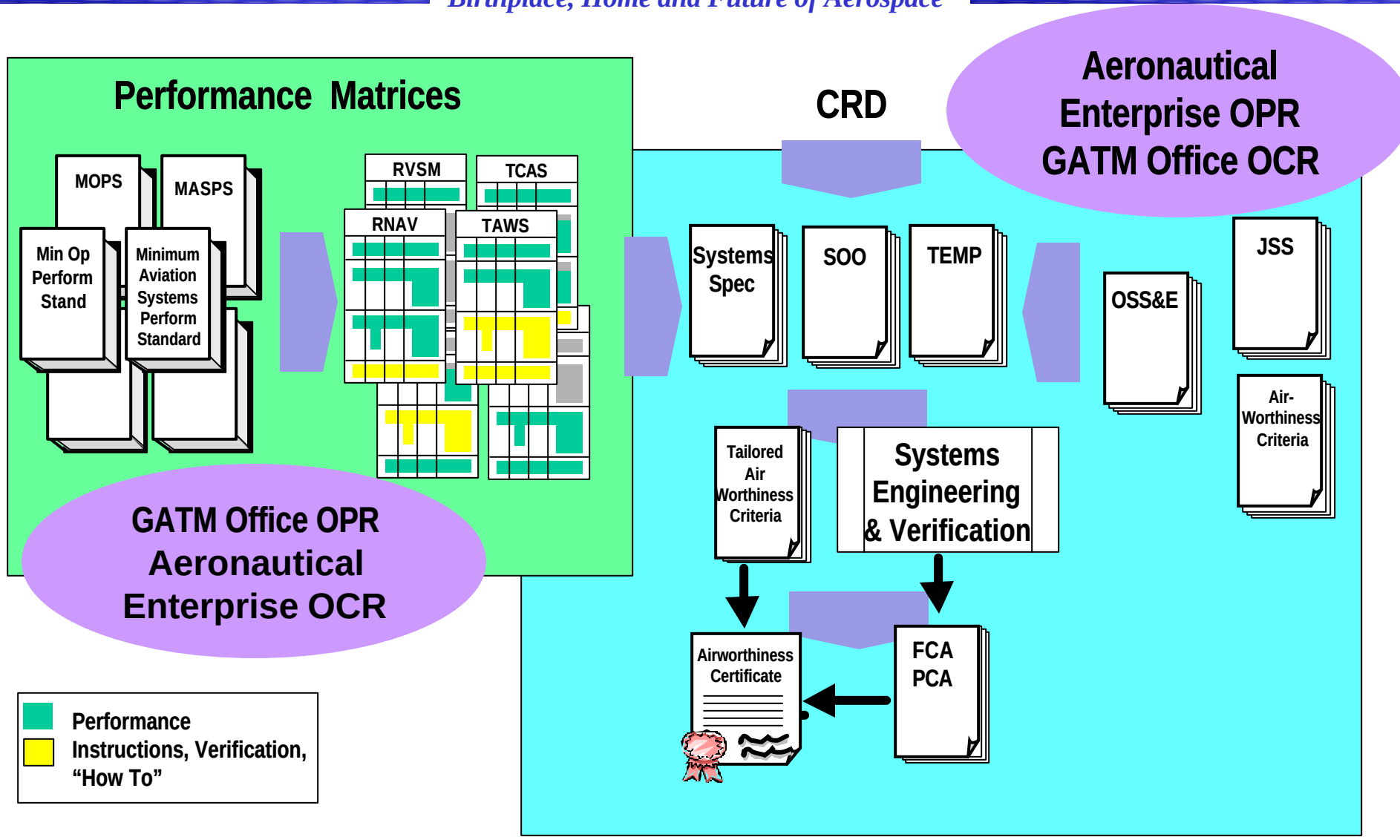

Summary

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- Air Worthiness Certification formally documents those attributes of a specific aircraft type that make it safe to operate – will now include GATM functionality
- GATM matrices have been revised to performance based, not prescription based criteria
- PEO/AT&T has issued summary of clarifications to System Program Directors
  - coordinated with SAF/AQQ/AQR, USAF/XORM/XOO-CA/AFFSA, and AFMC(ASC/AA/EN & ESC/GA/EN)